

REMARKS

Claims 2-21 are pending in the instant application. Claim 1 stands canceled. Claims 2 and 14 have been amended to more clearly delineate the claimed invention. Support for the amendment to the claims can be found throughout the application as filed, and at least at Figure 2.

Amendment of any claim herein is not to be construed as acquiescence to any of the rejections/objections set forth in the instant Office Action, and was done solely to expedite prosecution of the application. No new matter has been added.

Rejection under 35 U.S.C. § 103(a)

Claims 2-6, 8-11, 14-15, and 20-21 are rejected as being unpatentable over Todd et al. (US 5,082,975). Claims 7 and 16-19 are rejected as being unpatentable over Todd et al. (S 5,082,975) in view of Simpson (J. Inst. Brew. 1987, 93, pp. 405). Claims 12 and 13 are rejected as being unpatentable over Todd et al. (US 5,082,975) in view of Simpson (J. Inst. Brew. 1987, 93, pp. 405), and further in view of Todd (US 4,002,683). All three rejections are addressed together.

It is alleged that Todd discloses the synthesis of hexahydrolupulone and its use as a selective inhibitor of cell growth. Specifically, it is alleged that the pH of the aqueous hop acid solution or the pH of the process medium is not provided in Todd, but that the process medium of Todd would inherently have a high pH due to the hydroxide ions. It is further alleged that it would have been obvious to use the teachings of Todd to inhibit the growth of unwanted cells except for yeast.

It is further alleged that Simpson discloses alkaline aqueous solutions of isomerized hop acids, and that it would have been obvious to modify the disclosure of Todd to include the Simpson alkaline aqueous solutions of isomerized hop acids.

It is also alleged that Todd ('683) further discloses a process for isomerizing alpha acids to iso-alpha acids.

Applicants disagree and respectfully traverse but have amended the claims in order to more clearly delineate the invention.

The instant claims, as currently amended, are directed towards a method for inhibiting bacterial growth in an aqueous process medium using a hop acid, wherein hop acids are added to yeast in a yeast growing tank and the yeast growing proceeds under aerobic conditions, and after yeast growth, the solution is transferred to a process medium.

To establish a *prima facie* case of obviousness, three criteria need be met: (i) there must be a suggestion or motivation to modify the reference or combine the teachings; (ii) there must be a reasonable expectation of success; and (iii) the prior art reference must teach or suggest all the claim limitations. See, MPEP 2143. Applicants submit that at least one of the three criteria is not met in the rejection stated in the Action.

Todd is directed towards a synthetic method of converting beta acids into reduced beta acids. Todd indicates that beta acids may be added to a yeast culture to inhibit bacterial growth (column 3, lines 7-8), and that the reduced beta acids may be used in the brewhouse (column 8, lines 5-10). Additionally, Todd discloses that treatment of a sugar solution inoculated with yeast, with an alkaline beta hop acid solution in water, did NOT inhibit fermentation.

The Applicants' claims as amended include a distinct and separate step wherein the hop acid and yeast are added into a yeast growing tank under aerobic conditions, in order to allow the yeast to grow while avoiding/minimizing fermentation. The reason that fermentation is minimized at this point is that a buildup of ethanol resulting from fermentation will destroy the activity of the yeast. The motivation for yeast growing (in Applicants' claimed subject matter but not taught or suggested in Todd) is distinct and in fact contrary to the motivation for yeast use in Todd. Thus, the motivation of the yeast growing step is to maximize yeast growth in the presence of oxygen while at the same time minimizing fermentation, so that the yeast can be used later in the fermentation vessel.

Todd simply does not teach or suggest a separate step to grow yeast under aerobic conditions that minimize fermentation. As indicated supra, step (b) of Applicants' amended claims 2 and 14 is directed towards the growth of yeast in a yeast growing tank under aerobic conditions with a hop acid, which is a separate and distinct step from fermentation. Thus, the Applicants' claims as amended include a distinct and separate step wherein the hop acids and

yeast (and in certain instances a feedstock solution) are added into a yeast growing tank where yeast growth proceeds under aerobic conditions, so that fermentation is minimized while the yeast grows. This claim element is not taught or suggested by Todd and as such a *prima facie* case of obviousness fails to be established.

The Action also alleges at page 5 that one of ordinary skill in the art would have been motivated to modify Todd to employ a lactobacillus-inhibiting amount of hexahydrolupulone during the stages of yeast growth. Applicants disagree and consider the Action's statement to be an overbroad interpretation of the disclosure of Todd. Example 6 of Todd clearly states that "Similar treatment of a 10% sugar solution, inoculated with yeast, did not inhibit fermentation (emphasis added). Accordingly, it is evident that the hexahydrolupulone solution may be used to selectively inhibit growth of specific cell lines...". The text of Todd is therefore directed towards the treatment of a sugar solution, yeast and hexahydrolupulone, for fermentation. This statement in Todd merely relates to fermentation and provides no teaching whatsoever in regards to yeast propagation. Yeast propagation is nowhere alluded to in Todd. Applicants' claims as amended include a distinct and separate step wherein the hop acids and yeast are added to a yeast growing tank wherein yeast growing proceeds under aerobic conditions, so that yeast growing is maximized and fermentation is minimized. Again, Applicants' claims as amended are thus distinct from Todd and Todd does not provide any suggestion of a method having a separate yeast growing step, nor even of yeast propagation generally.

For the reasons stated above, Applicants submit that Todd does not provide any motivation, reasonable expectation of success, or provide a disclosure of all of the elements of the Applicants' claims as amended. Applicants submit that the rejection is overcome and respectfully request withdrawal of the rejection.

Simpson also does not provide a method of adding hop acids to yeast in a yeast growing tank under aerobic conditions. Simpson relates to a study of acid washing of pitching yeast slurries. Thus, Simpson relates to used yeast (that is, post fermentation), which is different and distinguishable from Applicants' claims as currently amended. Simpson does not recify the deficiencies of Todd in providing the Applicants' claimed invention, as currently amended. Additionally, Simpson does not provide any teaching or suggestion of adding hop acids to yeast in a yeast growing tank under aerobic conditions.

For the reasons stated above, Applicants submit that Todd in combination with Simpson does not provide any motivation, reasonable expectation of success, or provide a disclosure of all of the elements of the Applicants' claims as amended. Applicants submit that the rejection is overcome and respectfully request withdrawal of the rejection.

Todd ('683) also does not teach or suggest the Applicants' claims as currently amended, nor does Todd '683 rectify the deficiencies of Todd ('975) in combination with Simpson. Todd '683 does not provide any teaching or suggestion of adding hop acids to yeast in a yeast growing tank for yeast propagation under aerobic conditions.

For the reasons stated above, Applicants submit that Todd, in combination with Simpson and further in view of Todd '683, does not provide any motivation, reasonable expectation of success, or provide a disclosure of all of the elements of the Applicants' claims as amended. Applicants submit that the rejection is overcome and respectfully request withdrawal of the rejection.

In view of the above remarks, Applicants believe the pending application is in condition for allowance. Should any of the claims not be found to be allowable, the Examiner is requested to telephone Applicants' undersigned representative at the number below. Applicants thank the Examiner in advance for this courtesy.

The Director is hereby authorized to charge or credit any deficiency in the fees filed, asserted to be filed or which should have been filed herewith (or with any paper hereafter filed in this application by this firm) to our Deposit Account No. 04-1105, under Order No. 51035-61755.

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Respectfully submitted,

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